

The University of Chicago

PUBLIC LIBRARY SERVICE IN THE
MIDDLE WEST

A PART OF A DISSERTATION SUBMITTED TO THE
FACULTY OF THE GRADUATE LIBRARY SCHOOL
IN CANDIDACY FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY

1936

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G. FLINT PURDY

LIBRARIANS have long recognized the prevalence of extreme inequality in library service among different areas. They have deplored a condition in which forty-five million Americans are without access to any sort of local public library, while other millions are but meagerly served. They are firmly convinced that greater equality in access to books is an end worthy of strenuous individual and collective effort. They believe that this end may be more conveniently and economically furthered through the medium of the public library than by any other apparent means.

It is not the purpose of the present analysis to examine the validity of the convictions thus stated, although some evidence which bears upon their reasonableness will be presented. Nor is it assumed that the convictions are necessarily correct. The investigation upon which the present article is based represents an objective analysis of variations in public library facilities, support, and use among 622 counties of seven middle western states. Its purposes are: (1) to describe variations in public library resources and service among the 622 counties; (2) to ascertain some of the causes of the variations thus described and to measure their relative and combined importance; (3) to measure the degree to which public library development is spatially associated with the distribution of reading materials from other sources; (4) to measure the association between library development and the distribution of radios, telephones, automobiles, and the status of secondary education; and (5) to interpret in terms of their social and library implications the facts thus described. It is hoped that the considerations de-

¹ Part of unpublished Doctor's thesis, Graduate Library School, University of Chicago, 1936.



finer may serve in some measure to clarify thinking with respect to the status of the public library in American society, to the end that future development may be more intelligent, better co-ordinated, and more effective. In the words of Isaiah Bowman:

We are not to suppose that measurement alone provides dependability in argument and conclusion. Unmeasurable conditions—many forms of commitment being intangible—are as often as not the decisive elements. However, a scientific treatment requires that we measure all the measurable things that are found important and thus attain progressively higher degrees of precision in handling the data of a problem, and expressing a meaning. We strive by measurement to reduce the number of variables in our thinking.²

THE MIDDLE WEST DEFINED

Woofter has defined a region as "an area within which the combination of environmental and demographic factors have created a homogeneity of economic and social structure."³ There is no doubt that the Middle West constitutes such a region, although there is little agreement among students of regionalism as to the exact area to which the name applies. Strictly speaking, its boundaries are zones rather than definite lines. In this study the area defined as the Middle West embraces the states of Illinois, Indiana, Iowa, Michigan, Minnesota, Ohio, and Wisconsin. The region thus delineated represents a compromise between social and economic homogeneity, areal unity, and political boundaries.

METHOD

After the scope of the analysis to be undertaken was defined and the area to be studied was fixed, the procedure was as follows:

First, the facts concerning (1) population served, (2) total expenditure, (3) volumes owned, (4) number of registrants, and (5) number of volumes loaned, for 1,441 free, tax-supported

² *Geography in relation to the social sciences* (New York: Scribner's, 1934), p. 67.

³ National Resources Committee, *Regional factors in national planning and development* (Washington, 1935), p. 142.

public libraries in the seven middle western states were summarized by county.

Second, the library data were converted into per capita or percentage figures, using the entire population of each county as the base. Thus (1) and (4) were expressed as per cents of the total population, while the other three factors were stated in per capita terms.

Third, the status of each county with respect to each of the five factors representing library resources and service was expressed as an index number, in the form of the percentage which the given figure for the county was of the corresponding figure for the seven states considered as a unit. Thus, the per capita public library expenditure of each county was divided by and expressed as a percentage of the per capita public library expenditure of the region as a whole.⁴

Fourth, the five index numbers were combined in various ways in an attempt to secure a useful composite "index of library service." That finally accepted as reasonably satisfactory is a composite of four of the factors enumerated above (per cent of population served being omitted).

Fifth, a study was made of the spatial association between public library development (as measured by the county compilation of library data) and the distribution of general magazines, farm journals, daily newspapers, weekly newspapers, radio receiving sets, residence telephones, passenger automobiles, school enrolment, urbanization, and wealth. For this purpose a sample of 154 counties was used, 22 selected at random from each state. This sample will be subsequently referred to as the "general" sample. The relative status of the various counties with respect to library development was compared with their status according to each of the other variables, by means of conventional techniques of statistical correlation.

Sixth, two samples of 100 counties each were selected for further study. One consisted of counties in which more than 50 per cent of the residents resided in incorporated places of 2,500 population or more in 1930. This group will be referred to

⁴ See p. 350, for more complete explanation of the indices.

as the "urban" sample. The other consisted of counties in which less than 25 per cent of the population was urban. The latter will be called the "rural" sample. Each of these samples was used as the basis for a brief analysis of spatial association similar to that based on the general sample.

Finally, a summary and synthesis of the findings of the study was attempted with a view to pointing out their probable significance in relation to the future development of public library service in the region.

PUBLIC LIBRARIES IN THE MIDDLE WEST⁵

The 1,441 free, tax-supported libraries included in this study were distributed among the seven states as follows: Illinois, 274; Indiana, 222; Iowa, 179; Michigan, 196; Minnesota, 130; Ohio, 211; Wisconsin, 229. The approximate location of each city and town in which a public library was situated is shown in Figure 1. Forty-five counties, or 7.2 per cent of the 622 in the region, had no public library within their borders in 1933. Nine of the forty-five were in Illinois, one in Indiana, one in Iowa, ten in Michigan, thirteen in Minnesota, seven in Ohio, and four in Wisconsin.

Since some counties are more efficiently served by one library than are others by several, the number of public libraries in a given county, as shown in the figure, is of questionable significance. However, the distribution of dots is roughly indicative of the relative proximity of public libraries to the residents of different areas. Hence, the figure affords some indication of the relative accessibility of library materials.

⁵ The sources of the data analyzed in this section were as follows: Illinois State Library, *Report of the Library Extension Division for January 1, 1932 to December 31, 1933* (Springfield, 1934); Indiana State Library, "Public library statistics for the year ending Dec. 31, 1933," *Library occurrence*, XI (1934), 195-99; Iowa Library Commission, *Seventeenth report of the Iowa Library Commission . . . for the biennial period July 1, 1932 to June 30, 1934* (Des Moines, 1934); Michigan State Library, *Statistics of public libraries, 1933-1934* (Lansing, 1935); Minnesota Department of Education, Library Division, "Statistics of public libraries, 1933," *Library notes and news*, XI (1934), 1-6; Wisconsin Free Library Commission, *Twentieth biennial report—Public library statistics, 1934* (Madison, 1934). Data for the public libraries of Ohio were consulted in the State Library in Columbus. Population data are from the *Fifteenth census of the United States: 1930*.

The index of library service for each county is a composite, abstract figure based on the status of the county with respect to each of four factors: per capita expenditure, per capita volumes, per cent of population registered, and per capita circulation.

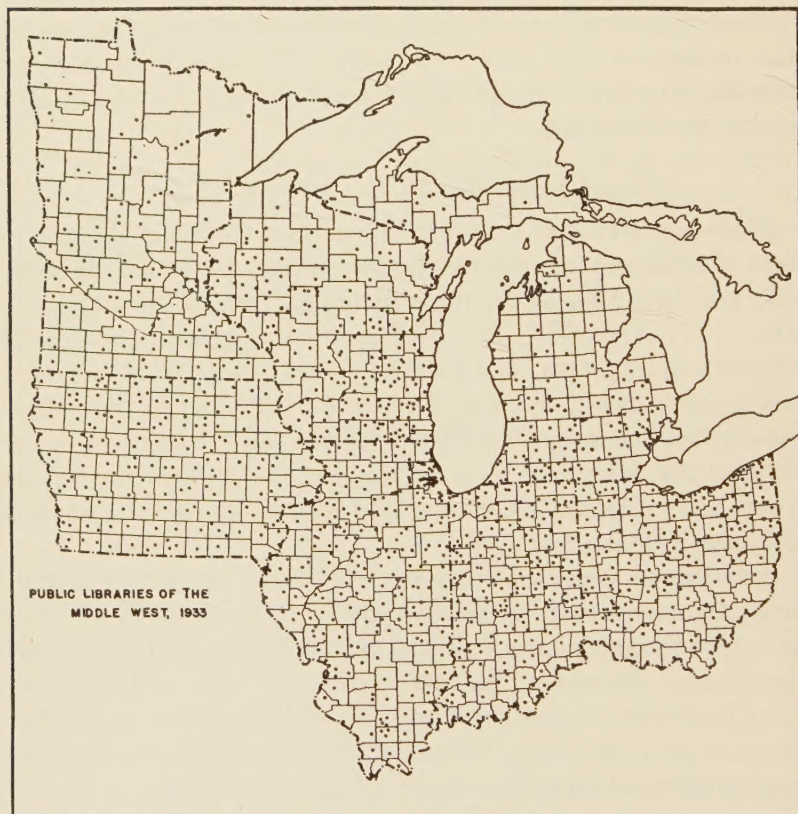


FIG. 1.—Public libraries of the Middle West, 1933

The nature of the index may perhaps best be explained by means of an illustration. Table 1 shows how the index for Black Hawk County, Iowa, was computed. Column 1 presents the status of Black Hawk County with respect to each of the four factors. It shows that in 1933 the public libraries of the county spent \$0.492 per county inhabitant, loaned 7.21 volumes per

capita, etc. Column 2 shows the status of the Middle West as a whole. In 1933 the public libraries of the region spent \$0.409 per inhabitant of the region, loaned 4.83 volumes per capita, etc. Each index in Column 3 is the quotient of the two corresponding figures in Columns 1 and 2. Thus the per capita expenditure of the libraries of Black Hawk County was 120.3 per cent of the per capita expenditure of the libraries of the entire region, etc. The index of library service for Black Hawk County (130.4) is the average of the four percentage figures thus derived. It is apparent that the index is purely "relative,"

TABLE 1
DERIVATION OF INDEX OF LIBRARY SERVICE

FACTORS CONSIDERED	1	2	3
	Black Hawk County	Middle West	Index
Per capita expenditure*.....	49.20	40.90	120.3
Volumes per capita.....	1.02	0.91	112.3
Per cent of population registered...	33.30	23.90	139.3
Per capita circulation.....	7.21	4.83	149.5
Average (Index).....			130.4

* In cents.

since it presents a composite picture of the relative status of the various counties with respect to public library support, resources, and use. The index has been justified empirically. As is true of the separate data which it combines, it does not necessarily provide a reliable basis for comparison of library service in individual areas. Within the region as a whole, however, the general pattern presented is reasonably representative of the relative status of public library service among the several counties.

The distribution of 616 counties according to their respective indices of library service is presented in Figure 2. The figure is read as follows: Of the 616 counties for which reasonably complete data were available, 49 had indices of less than 5; of the 49, 45 were entirely without public library service; 12 counties

had indices between 5 and 15; 24 between 15 and 25, etc. The index for the region as a whole was, of course, 100. The median or middle county of the 616 had an index of 66.5. Thus half of the 616 counties had indices smaller than 66.5. The "skew" of the figure, i.e., its divergence from symmetry, shows most

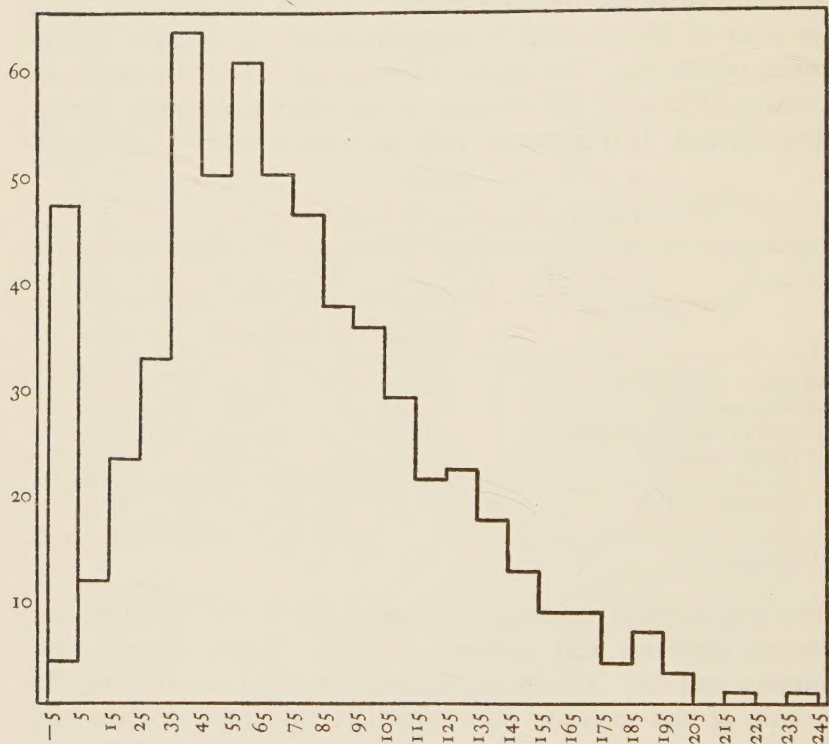


FIG. 2.—Distribution of 616 middle western counties according to their respective indices of library service, 1933.

of the counties in the lower half of the range and comparatively few in the upper half. That is, the status of most of the counties was low in comparison with that of a few. More concrete evidence of the extent of the disparity is afforded by consideration of some of the original data. Table 2 shows the median county of each state and of the whole region with respect to each of the five factors representing library service. It is evident that

the seven states vary widely in the degree of public library service which they maintain. Thus in per capita expenditure a range of from \$0.111 in the median county of Minnesota to \$0.297 in the median county of Indiana is shown. In circulation the range is from less than a volume and a half per capita in Minnesota to more than five volumes per inhabitant in Indiana. In half of the counties in the region less than 36.3 per cent of the population resided in library districts in 1933, less than \$0.18 per county inhabitant was spent for public library

TABLE 2

PUBLIC LIBRARY SERVICE IN SEVEN MIDDLE WESTERN STATES, 1933
(As represented by the median county of each state with respect to each factor)

State	Per Cent of Population Served	Per Capita Expenditure in Cents	Volumes per 100 of Population	Per Cent of Population Registered	Circulation per 100 of Population
Illinois.....	36.3	19.8	62.8	17.7	300.0
Indiana.....	60.4	29.7	113.1	30.0	502.8
Iowa.....	28.4	17.8	78.6	16.2	294.4
Michigan.....	39.3	16.0	67.5	17.0	263.9
Minnesota.....	20.5	11.1	38.2	12.1	144.5
Ohio.....	38.1	15.3	62.7	18.1	228.1
Wisconsin.....	35.0	21.4	76.4	23.5	384.4
Midwest.....	36.3	17.9	72.8	18.4	291.8

service, and less than three volumes per capita were loaned by public libraries. In only 45 counties, 7.2 per cent of the 622 in the region, did public library expenditures aggregate as much as \$0.50 per capita. The public libraries of approximately one-fourth of the counties in the region spent \$0.25 per capita or more. The libraries of a similar number of counties loaned as many as five volumes per inhabitant.

The approximate index of library service for each county in the Middle West is presented in Figure 3. Interpretations of this map must be made with caution. In counties having indices of less than 33.4, public library development is roughly less than one-third as great (quantitatively) as library development in the region as a whole. In the second group of counties, those having indices between 33.4 and 66.6, library development is

from one-third to two-thirds that of the region as a whole, etc. If an index of 100 were regarded as a very tentative standard, it would probably be fair to say that public library service was definitely inadequate in the counties which are white in Figure

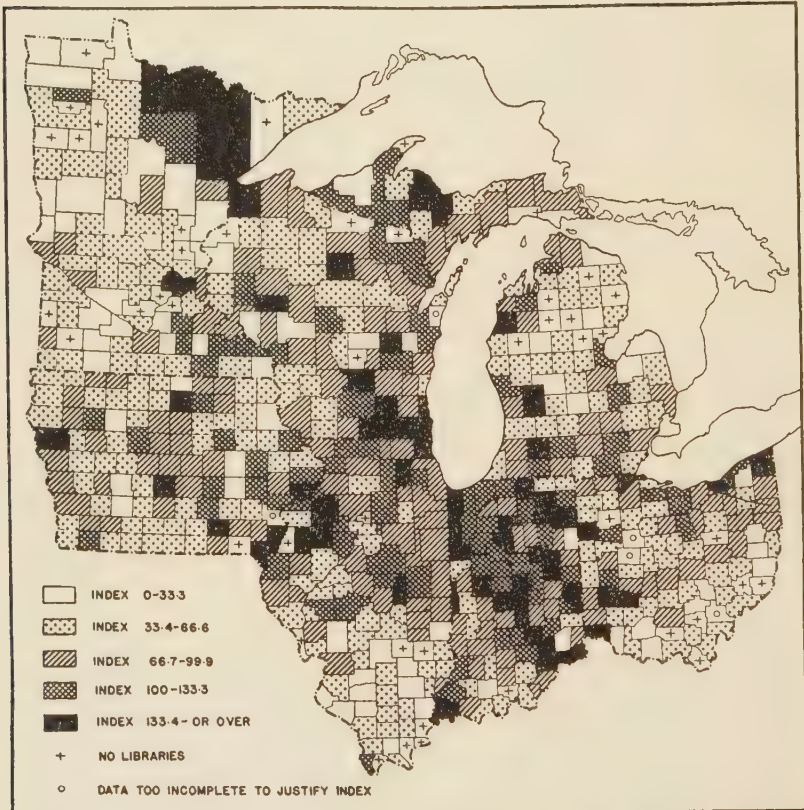


FIG. 3.—Index of library service of each county in seven middle western states, 1933.

3, that it was decidedly substandard in counties of the 33.4-66.6 group, and that only in the two highest groups did it compare favorably with that of the region as a whole. Clearly there is little semblance of equality in access to public library service among the counties of the Middle West. The next step in the

analysis is an examination of some of the possible causes of the disparity thus defined.

Of the many factors which have been suggested as probable causes of variation in library development, several are approximately constant among the counties of the Middle West, and hence not directly pertinent to the present study. In this category are such factors as topography, climate, race, and age distribution of the population. Other factors which have been suggested are not now amenable to quantitative analysis. It is the purpose of this section to "strive by measurement to reduce the number of variables in our thinking." Factors which lend themselves to quantitative treatment and which may be important in relation to public library development include: (1) economic ability, (2) urbanization, (3) the status of reading as a source of ideas and recreation, (4) the educational level of the population, (5) recent trends with respect to growth of population, and (6) nativity of the population. The extent to which each of the six factors tends to vary among the 622 counties, in relation to variations in library development, is indicated by the coefficients of correlation⁶ summarized in Table 3. It is assumed for the present purpose that the data presented are more or less representative of the factors enumerated above, in the same order.

The economic index is a composite figure based on (1) ratio of federal personal income tax returns to population (incomes of 1932),⁷ and (2) per capita retail sales, 1930.⁸ The two factors

⁶ According to L. L. Thurstone, "The correlation coefficient is a pure number, a constant which indicates the degree of relation between two variables. It varies from $+1$ to -1 . When the relation is perfect and positive, the correlation coefficient is $+1$. When the relation is perfect but inverse, the correlation coefficient is -1 . When there is no relation whatever between the two variables, the coefficient is zero. Other values of the coefficient indicate intermediate degrees of relation." (*The fundamentals of statistics* [New York: Macmillan, 1935], p. 205.) For complete definitions and explanations of the statistical constants employed see Karl Holzinger, *Statistical methods for students of education* (New York: Ginn, 1928), pp. 141-89 and 256-316, and Mordecai Ezekiel, *Methods of correlation analysis* (New York: John Wiley, 1930).

⁷ Income tax data from *Rand McNally Commercial Atlas* (66th ed.; New York: Rand McNally, 1934); population data from the *Fifteenth census of the United States: 1930*.

⁸ Retail sales data from U.S. Bureau of Foreign and Domestic Commerce (Department of Commerce), *General consumer market statistics* ("Domestic Commerce Series," No. 56; Washington, 1932).

were combined in the same way as that in which the four library factors were combined in computing the index of library service. The table is read as follows: The degree of linear association between the library index and the economic index is indicated by a Pearson product-moment coefficient of correlation of $.733 \pm .038$, etc. Each of the first five factors is significantly associated with library development. However, since the "causal" factors are undoubtedly interrelated, it is desirable that an attempt be made to ascertain the separate influence of each. Since an ex-

TABLE 3
ZERO ORDER COEFFICIENTS OF CORRELATION REPRESENTING THE DEGREE OF
ASSOCIATION BETWEEN THE LIBRARY INDEX AND SIX FACTORS
OF POSSIBLE CAUSAL SIGNIFICANCE

Factor Correlated with the Library Index	Coefficient of Correlation*	
1. Economic index.....	+ .733	$\pm .038$
2. Per cent population rural farm†.....	- .680	$\pm .044$
3. Combined circulation of 1,927 daily newspapers‡.....	+ .567	$\pm .055$
4. Per cent population 14-17 years of age in school, 1930†..	+ .442	$\pm .065$
5. Per cent change in population 1920-30†.....	+ .597	$\pm .052$
6. Per cent native white of native parents†.....	- .026	$\pm .081$

* Based on the general sample.

† Adapted from data reported in the *Fifteenth census of the United States: 1930*.

‡ Adapted from U.S. Bureau of Foreign and Domestic Commerce (Department of Commerce), *Market data handbook of the United States* ("Domestic Commerce Series," No. 30; Washington, 1929).

amination of Table 3 indicates that economic ability and urban-rural distribution (as measured by factors 1 and 2 of the table) are more closely associated with library development than any of the other factors enumerated, consideration of their relative and combined importance is in order. Table 4 presents a summary of some of the more important partial and multiple coefficients. The first partial coefficient (+.410) is an index representing the degree of relationship between library development and wealth (as measured by the economic index), in counties having the same percentage of their population rural farm. The second (-.183) is an index of the association between library development and the per cent of population which is rural farm in counties of similar economic ability. Among the

154 counties of the sample, it is apparent that library development is more closely (or more directly) associated with the economic index than with urbanization. The other two partial coefficients (+.538 and $-.112$) confirm this conclusion. Because of the size of the sample, the slight difference between the zero order coefficients, and the questionable degree to which the quantitative indices represent library development, wealth, and urbanization, the relative importance of the two causal factors as indicated in the table must be regarded as suggestive, not final. However, subsequent analysis tends to confirm the evidence of Table 4.

TABLE 4
PARTIAL AND MULTIPLE COEFFICIENTS OF CORRELATION INDICATIVE OF
THE RELATIVE AND COMBINED INFLUENCE OF URBANIZATION
AND WEALTH ON LIBRARY DEVELOPMENT*

Factors Correlated		Factor Held Constant	Partial r	R
Library index.	Economic index	Per cent rural farm	+ .410	.744
Library index.	Per cent rural farm	Economic index	$-.183$	.744
Library expenditure	Economic index	Per cent rural farm	+ .538	.800
Library expenditure	Per cent rural farm	Economic index	$-.112$	.800

* Based on the general sample of 154 counties. A coefficient between $+.158$ and $-.158$ is less than twice its standard error.

The first multiple coefficient (.744) represents the degree of association between library development and the two causal factors combined. The square of the multiple coefficient indicates the approximate per cent of the variation in the library index which is associated with variations in the two causal variables. Thus $(.744)^2$ or approximately 55 per cent of the variation in the library index, is associated with variations in the economic index and the per cent of population which is rural farm. Similarly, 64 per cent of the variation in public library expenditure among the 154 counties is associated with variations in wealth and urbanization, as measured.

The coefficients of part correlation are worthy of somewhat more confidence than are the partial coefficients, since the former involve a less complete attempt to separate wealth and

urbanization. Letting X_1 represent the library index, X_2 the economic index, X_3 the per cent of population which is rural farm, the part coefficients representing the degree of association between the library index and wealth and urbanization, respectively, with the influence of the third factor upon the library index held constant are: $_{12}r_3 = .632$ and $_{13}r_2 = .320$. The partial regression equation for predicting the library index from the economic index and per cent of population which is rural farm is: $X_1 = 50.97 + .494X_2 - .518X_3 \pm 28.03$. The beta coefficients are $\beta_{12.3} = +.545$ and $\beta_{13.2} = -.226$.

A similar analysis based on the sample of 100 urban counties yields results almost identical with those reported above. In case of the rural sample, however, the zero order coefficients are too small to justify more refined analysis. Apparently wealth and urbanization are less significant in relation to library development in the rural counties of the region than in their urban neighbors or in the region as a whole. It is probable that the necessity of excluding counties with no public library service resulted in an artificial situation which would invalidate conclusions based on a correlation analysis of the rural sample.

Figure 4 presents the approximate status of each county in the region according to its economic index. Comparing Figure 4 with Figure 3 (the library index map), 97 counties (15.6 per cent of 622) are seen to vary two or more intervals. If only chance association operated, approximately half of the counties would vary at least two intervals. A similar comparison of Figure 4 with a map portraying library expenditure (not reproduced here) reveals a significantly different status with respect to the two factors in case of 53 counties, or 8.5 per cent of the total. A comparison of the library index and library expenditure maps with a map of urbanization shows that 105 and 108 counties, respectively, vary two or more intervals. It should be remembered in comparing the maps that their primary purpose is descriptive. Comparisons based upon them are admittedly crude, but nevertheless serve to illuminate the statistical constants describing the relationships.

The foregoing paragraphs have served only partially to clarify

the relative importance of wealth and urbanization as causes of variation in library development. There can be little doubt that urbanization is a potent factor, particularly when its total influence, direct and indirect, is considered. The statistical anal-

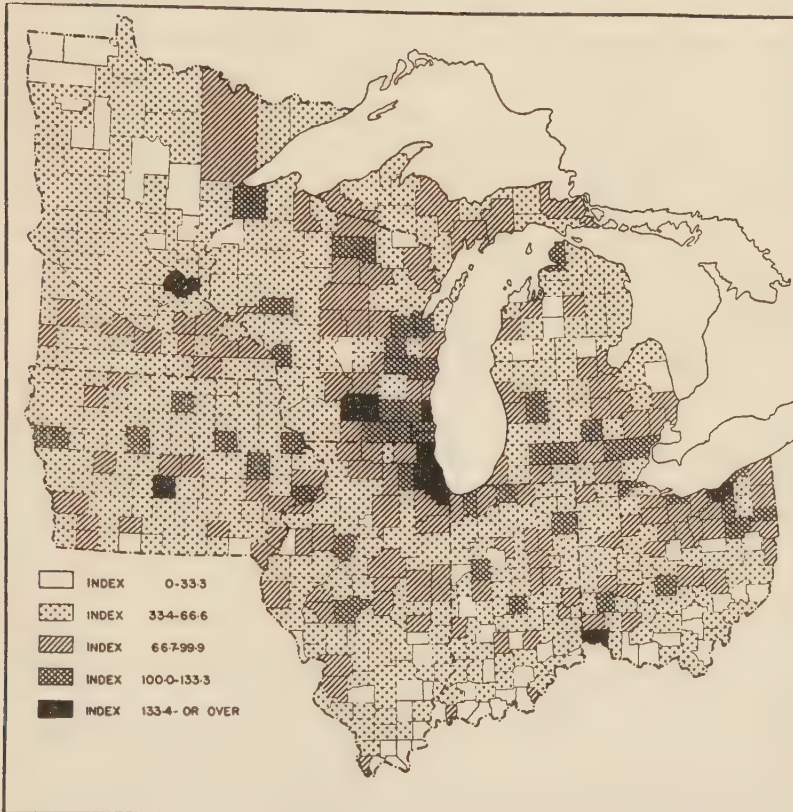


FIG. 4.—Economic status of each county in seven middle western states according to an index of economic ability.

ysis has suggested, however, that rural areas lack library service not primarily because of difficulties involved in establishing contacts between books and rural readers, but because the rural areas generally lack economic resources for the support of libraries. Other studies have shown that farm incomes average considerably lower than those of city dwellers, thus leaving a

smaller margin above a subsistence level for the purchase of "cultural things," including newspapers, magazines, and books, and for the support of schools, libraries, churches, etc.⁹

Thus far the analysis has considered the influence of only two of the causal factors enumerated on page 355. Second order partial coefficients representing the degree of association between the library index and the other causal factors, while wealth and urbanization are held constant, indicate no significant relationship between library development and percentage change in population, 1920-30, or between library service and nativity of population. Table 5 presents the statistical con-

TABLE 5

PARTIAL CORRELATION CONSTANTS REPRESENTING THE RELATIVE AND COMBINED INFLUENCE OF FOUR FACTORS UPON LIBRARY DEVELOPMENT

Factor Correlated with Library Index	Factors Held Constant*	Partial r	Part r	β	R
Economic index.	X_3, X_4, X_5	+ .401	.653	+ .512	.768
Per cent of population rural farm. . . .	X_2, X_4, X_5	- .080	.153	- .099	.768
Newspapers.	X_2, X_3, X_5	+ .191	.254	+ .168	.768
Per cent of population, 14-17 years of age, in school.	X_2, X_3, X_4	+ .147	.175	+ .114	.768

* X_1 = library index; X_2 = economic index; X_3 = per cent rural farm; X_4 = ratio of daily newspapers to families; X_5 = per cent of population, 14-17 years of age, in school.

stants indicating the relative and combined influence of the other four variables upon library development. The data of the table indicate that for the 154 counties of the general sample the library index is most closely associated with the economic index and least closely associated with the per cent of population which is rural farm. The two smallest partial coefficients are less than twice their standard errors. From the fact that $R^2_{1.2345} = .59$, we conclude that approximately 59 per cent of the variation among the 154 counties in library development is associated with variations in the four causal factors. Since $r_{12} = .733$ and $r^2_{12} = .537$, it is clear that the factors measured by the economic index alone account for almost as much of the

⁹ See J. H. Kolb and Edmund Brunner, *A study of rural society, its organization and changes* (Boston: Houghton Mifflin, 1935).

variation in the library index as do the factors measured by all four variables of Table 5. This fact is also shown by the similarity of $S_{1.2345}$, which is 26.8 and $S_{1.2}$, which is 28.5.

Figure 5 shows in graphic form the apparent influence of the factors measured by the economic index upon library development as measured by the library index. Each dot represents the

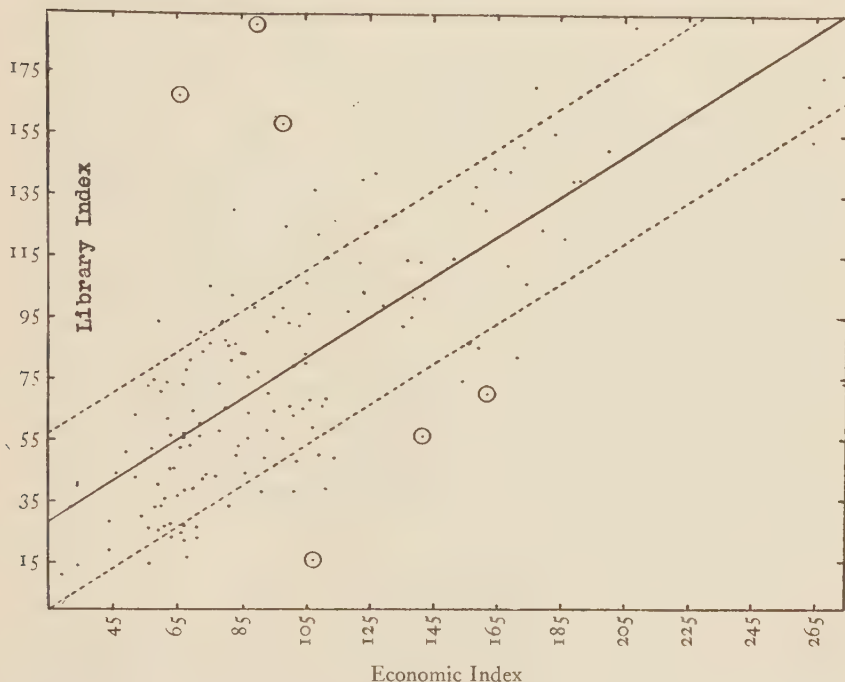


FIG. 5.—Scattergram and regression line illustrating the association between the economic index and the library index.

status of one of the 154 counties of the general sample in library development compared with its status with respect to the economic index. Obviously, the counties which rank relatively high in economic ability tend to rank high in library development, while counties that rank low in wealth also rank low in library service. This relationship is represented in generalized graphic form by the solid line in the figure. The regression equation represented by the solid line is: $X_1 = 11.983 + .6648X_2$

± 28.5 . The dotted lines are one S above and below the regression line. Their distance from the regression line indicates the extent to which the generalized empirical description conforms to the actual data, i.e., the reliability of predictions of the library index based on known values of the economic index.

The counties encircled in the figure were used as a basis for a study of the importance of other factors. It was concluded that the following factors appeared to be of possible causal significance in accounting for the extreme deviation of the six counties from the norm: (1) questionable validity of the economic index as applied to specific counties, (2) the presence of nonpublic libraries in the county, (3) sparsity of population, (4) the unit of library service, (5) the number of towns in the county, and (6) the educational status of the population.

Obviously many factors which condition library development in specific areas have not been examined. It has been the purpose of this analysis to "reduce the number of variables in our thinking," not to attempt an exhaustive enumeration and evaluation of all elements which affect variations in library service. Since approximately 60 per cent of the variation in the library index is accounted for, the analysis may be considered to have achieved its purpose.

DISTRIBUTION OF BOOKSTORES

The study so far has been concerned with the spatial distribution of public library facilities and service in the Middle West and with factors which appear to be partly responsible for the inequality described. Consideration of the distribution of nonlibrary phenomena which may conceivably supplement library service is now in order. Strictly speaking, the library is not a disseminator of ideas. It is one of many purveyors of print. Print, in turn, is one of many vehicles of ideas. In order to view the status of library service in perspective it is desirable that some consideration be given other agencies and media instrumental in the dissemination of ideas.

According to the *American booktrade directory*¹⁰ there are ap-

¹⁰ New York: Bowker, 1935.

proximately 1,400 bookstores in 430 middle western cities and towns. Public libraries are found in more than three times as many towns as are bookstores. Exactly half of the counties of the region contain at least one book outlet, while 93 per cent

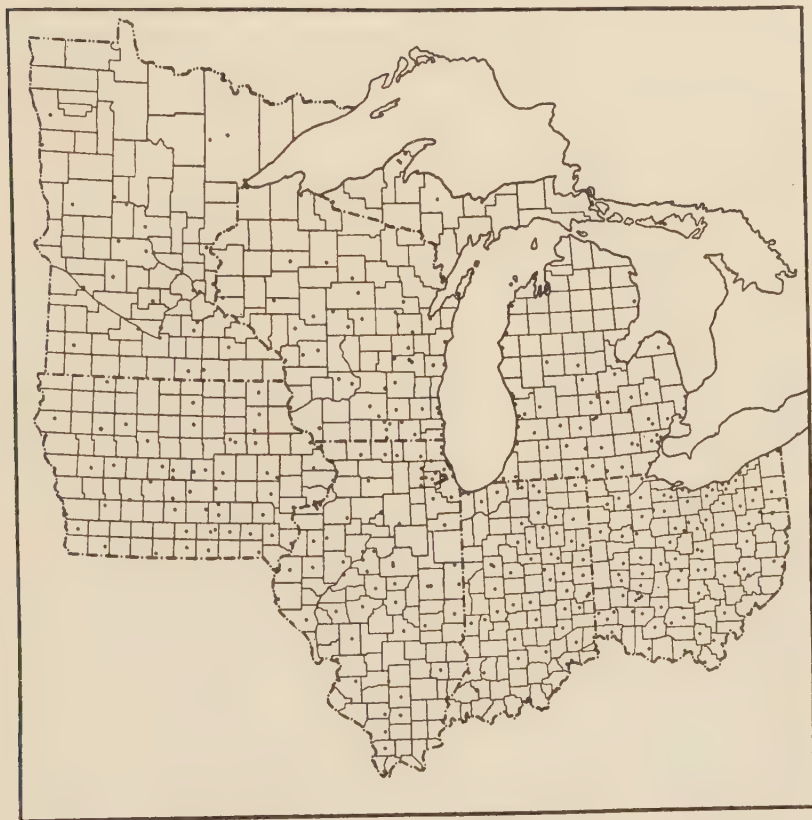


FIG. 6.—Towns having bookstores listed in the *American booktrade directory*, 1935

have at least one public library. Over two-thirds of the towns that have one or more bookstores are places of over 5,000 population. It is thus evident that the commercial book outlets are concentrated in urban areas. Figure 6 shows the approximate location of each town in which is located at least one of the bookstores listed in the *American booktrade directory*. Clearly the book marketing industry has devised no satisfactory system

of outlets for rural areas. A comparison of Figure 6 with the urban-rural data shows that the mean per cent of population which is rural farm for the 311 counties having book outlets is 33.7, and for those without bookstores, 51.6 per cent. The mean economic index of the 311 counties with book outlets is 73, compared with a mean of 47 for the counties without bookstores. Public libraries in the median county of the 311 having book-

TABLE 6
COEFFICIENTS OF CORRELATION INDICATING THE DEGREE OF ASSOCIATION
BETWEEN THE CIRCULATION OF PERIODICALS AND WEALTH,
URBANIZATION, AND LIBRARY DEVELOPMENT

Class of Periodical	Economic Index	Per Cent of Population Rural Farm	R*	Library Index	Library Circulation
15 general magazines†	+ .827	— .297	.844	+ .684	+ .678
Curtis and Crowell magazines‡	+ .440	— .274	.471	+ .315	+ .299
Daily newspapers†	+ .548	— .600	.606	+ .567	+ .556
Weekly newspapers†	— .590	+ .689	.690	— .551	— .573
Farm magazines§	— .627	+ .804	.654	— .498	— .518

* Multiple coefficient representing the combined influence of wealth and urbanization upon the circulation of the periodicals.

† Ratio of circulation to families. Circulation data from U.S. Bureau of Foreign and Domestic Commerce, *Market data handbook of the United States*.

‡ Ratio of combined circulation of Curtis and Crowell magazines to number of families. Circulation data from *Crowell circulations, 1934* (New York: Crowell Publishing Co., 1934) and *Sales opportunities, 1934-1935* (Philadelphia: Curtis Publishing Co., 1934). Families from the *Fifteenth census of the United States, 1930*.

§ Ratio of combined circulation of forty-two farm journals to families. Circulation data from Meredith Publishing Company, *Circulation of farm publications, 1929* (Washington: Government Printing Office, 1929).

stores loaned 4.1 volumes per capita in 1933, while 2.2 volumes per inhabitant were loaned in the median county of those without bookstores. Obviously the same areas which are relatively lacking in public library service are correspondingly lacking in sources from which books may be conveniently purchased.

DISTRIBUTION OF PERIODICALS

Table 6 shows the degree to which the circulation of periodicals is associated with wealth, urbanization, the library index, and library circulation. It is apparent that the circulation of general periodicals tends to coincide with public library develop-

ment and service. Counties with relatively well-developed public libraries buy more general magazines and daily newspapers than do counties of lower library status. Weekly newspapers and farm journals, on the other hand, tend to supplement public library service, in a spatial sense. Further analysis of the relationships shows that most of the association between library development and the circulation of periodicals is due to variations in wealth and urbanization. That is, library development tends to coincide with the circulation of periodicals largely because both are functions of wealth and urbanization. When the economic index and per cent of population which is rural farm are held constant, the resulting second order partial coefficients are: + .158 between the library index and the 15 general magazines; + .048 between the library index and the Curtis and Crowell magazines; + .250 between the library index and the 1,927 daily newspapers; - .153 between the library index and the weekly newspapers; and + .064 between the 42 farm journals and the library index.

NONREADING PHENOMENA INSTRUMENTAL IN THE DISSEMINATION OF IDEAS

A similar analysis of the distribution of four nonreading variables resulted in the data reported in Table 7. According to the first order coefficients, wealth appears to be significantly associated with the first three variables, while urbanization is associated with the last three. The distribution of radio receiving sets and of the percentage of population of high school age attending school tends to coincide with library development. There is a slight tendency for counties ranking high in library status to rank relatively high in ratio of residence telephones to families. No significant association appears to exist between library development and the distribution of passenger automobiles. The second order coefficients recorded in the final column of the table reveal significant relationship between library development and only one of the four nonreading variables (per cent of population 14-17 years of age, in school) in counties of similar wealth and urbanization.

SUMMARY AND CONCLUSIONS

Reading is one social medium of education and recreation. Books constitute one important means by which society preserves the intellectual heritage of the race and renders it available to contemporary and future generations. The public library is one social agency whose primary function is to make books available to society. This study has attempted to determine the

TABLE 7

ASSOCIATION BETWEEN FOUR NONREADING PHENOMENA, THE ECONOMIC INDEX, URBANIZATION, AND THE LIBRARY INDEX

NONREADING VARIABLES	ECONOMIC INDEX		PER CENT RURAL FARM		LIBRARY INDEX	
	Zero Order r	Per Cent Rural Farm Constant	Zero Order r	Economic Index Constant	Zero Order r	Economic Index and Per Cent Rural Farm Constant
Radios*	+ .542	+ .374	- .426	+ .056	+ .444	+ .097
Telephones†	+ .152	+ .412	+ .089	+ .396	+ .144	+ .133
Automobiles†	+ .060	+ .309	+ .131	+ .329	- .038	- .068
Per cent of population, 14-17 years of age, in school‡	+ .383	+ .009	- .454	- .264	+ .442	+ .220

* Ratio of radio receiving sets to families. Data from the *Fifteenth census of the United States: 1930*.

† Ratio to families. Data from U.S. Bureau of Foreign and Domestic Commerce (Department of Commerce), *General consumer market statistics* ("Domestic Commerce Series," No. 56; Washington, 1932).

‡ Adapted from data reported in the *Fifteenth census of the United States: 1930*.

relative success of the public library in making books available to the inhabitants of 622 middle western counties, why it fails to dispense an equal degree of service in all the counties, whether or not certain nonlibrary agencies and media tend to supplement public library service in a spatial sense, and what factors appear to be pertinent in planning more equitable public library service.

The nature of the study thus defined has necessitated the use of data representing quantitative aspects of library service. The limitations of available records are evident to anyone who has attempted to use them. Evidence not presented in this article justified the conclusion that the existing library data, im-

perfect as they are, are more accurately representative of the *relative* development of public library service in different areas than is commonly assumed.¹¹ The five indices of public library development and service were found to be highly consistent. Since all five told practically the same story, it seems reasonable to assume that the story must be an approximation of the actual relative status of the various counties with respect to library service, in so far as that service is measurable. The circulation data most closely approximate a composite index. In fact, correlation analyses based on the circulation figures yield results almost identical with those derived from similar analyses based on a composite index which combines four factors. This fact suggests that future studies making use of correlation techniques may well use circulation figures as a quantitative index of public library service, thus obviating the necessity of laborious computation.

The description of variations in library service among the counties of the region revealed a range from no service to complete coverage accompanied by service of a high type, judged by contemporary standards. The amount of service rendered in the majority of the counties is small in comparison with that rendered in a few areas.

Intercounty variations in public library development were compared with corresponding variations in fourteen nonlibrary factors assumed to be relevant. It was found, in general, that counties ranking relatively high with respect to library development ranked correspondingly high in wealth, radios, general magazines, daily newspapers, and "extent of popularization of education."¹² There was some tendency for counties of high library status to have more residence telephones in proportion to families than counties of low library status. The former tended to be more urban than the latter. There were fewer bookstores in the latter than in the former. The comparatively

¹¹ G. F. Purdy, "Public Library Service in the Middle West" (unpublished Doctor's thesis, Graduate Library School, University of Chicago, 1936).

¹² See G. N. Kefauver and James Rusk, "Variation in popularization of secondary education," *School review*, XLIII (1935), 112-18, for similar use of enrolment data.

poor, rural counties which ranked low in library development bought larger numbers of farm journals and weekly newspapers than did their wealthier urban neighbors. Table 8 summarizes some of the more important zero order coefficients of correlation indicating the degree of concomitant variation between the non-library factors and the data representing public library development. The positive coefficient representing the association between the library index and the economic index indicates that

TABLE 8

COEFFICIENTS OF CORRELATION REPRESENTING THE DEGREE OF ASSOCIATION
BETWEEN LIBRARY DEVELOPMENT AND ELEVEN NONLIBRARY VARIABLES

Nonlibrary Variables	Library Index	Library Expenditure	Library Circulation
Economic index.....	+ .733	+ .797	+ .728
Per cent of population rural farm.....	- .680	- .702	- .688
15 magazines.....	+ .684	+ .649	+ .678
Curtis-Crowell magazines.....	+ .315	+ .284	+ .299
Daily newspapers.....	+ .567		+ .556
Weekly papers.....	- .551		- .573
Farm journals.....	- .498		- .518
Radios.....	+ .444		+ .433
Telephones.....	+ .144		+ .134
Per cent of population, 14-17 years of age, in school.....	+ .442		+ .447
Automobiles.....	- .038		- .055

a relatively wealthy county usually has better developed library service than has a poorer county. The negative coefficient between the library index and the per cent of the population living on farms indicates that a county in which a large proportion of the population are farm dwellers tends to have less "adequate" library service than has a more urban county. The more nearly the coefficient approaches 1.0 or -1.0, the more accurately the generalized statement that one variable increases or decreases as the other increases applies, and the more nearly a given increase in one is accompanied by a regular change in the other.

It has been shown that in proportion to population, nearly

twice as many library books are loaned in counties which have bookstores as in counties without them.

The facts summarized above furnish evidence that the provision of the facilities for education and recreation which were considered tend to follow the same pattern. A county of low library status is usually also relatively lacking in general reading materials, radios, and telephones, and has a comparatively small proportion of its residents in the 14-17 year age group enrolled in school. These facts suggest that public library service is at least no less desirable in the areas now ranking low in library development than in those which rank high. If the equalization of opportunity to read is socially desirable in Cleveland, it seems reasonable to assume that it is equally desirable in Johnson County, Illinois. This assumption, however, necessitates two previous premises, namely, (1) that the equalization of reading opportunity is a legitimate social function, and (2) that the public library is the most effective and economical means of achieving that end. Obviously, the evidence examined in this study neither proves nor disproves these premises. The librarian, by the very nature of his position, accepts them as valid. A broad social consideration of the question, however, would necessitate an attempt to view the "place" and cost of public library service in perspective. Much study is needed before the librarian can avoid basing his philosophy upon unproved assumptions. The present study contributes toward an ultimate solution (1) evidence that other agencies of recreation and education do not, in general, supplement public library service among the counties of the Middle West, and (2) suggestions as to causal factors which must be considered in any plan proposing to render public library service more equitable.

The analysis of the relationships of selected quantitative factors to public library service confirms the importance of urbanization as a conditioner of "cultural" development, including the development of public libraries. It suggests, however, that urbanization is more important as a cause of variation in wealth than as a direct cause of inequality in library service.

The interrelations among the data examined suggest wealth

as the most important condition of community access to public library service. It is thus pertinent to ask how well the factor of wealth represents the total group of conditions, both measurable and unmeasurable, which may be expected to encourage communities to establish and support libraries. The data analyzed in the foregoing pages suggest that wealth is not only one of the most tangible and measurable of the conditions examined but a factor of major importance in itself. The values with which the American community, at least in the Middle West, is most concerned are largely associated with financial prosperity. Wealth is regarded not merely as a token of vocational success but as combining important benefits in social prestige, security, and opportunities for wider horizons—cultivation of the arts and the like. The services offered by the public library represent the latter type of use of money: the enrichment of personal and community life. Wealth is almost invariably first, cultivation after, although experience has shown that the principle is not immutable. Its application to services which society deems essential to the common good has been greatly modified. Formal education, being regarded as a matter of social concern, is subsidized by county, state, and federal governments; thus, in effect, wealth is confiscated from areas of greater economic ability for the support of schools in poorer communities. The same principle applied to the protection of health, the construction of highways, etc., has materially modified spatial inequalities in such facilities.

The growth of public library service under a traditional system of local autonomy has resulted in the wide disparity exemplified by the distribution of library facilities among the counties of the Middle West. This study has suggested the probability that any plan of equalization must aim at control of the principal causal factor which can be in some measure controlled, namely, inequality in wealth. The possibility of predicting library development from the economic index alone, within a relatively small error of estimate and nearly as accurately as from four factors combined, suggests the potential

value of economic data as a convenient and tangible basis for distributing subsidies.

The influence of wealth upon library service emphasizes the importance of adequate areas of support. Thousands of towns, townships, and even counties lack the wealth necessary to support effective library service. In many areas the unit could be adjusted to permit a workable balance between an adequate basis of support and a practicable area of service. In others no adjustment of local units can provide adequate support.

While wealth appears, in general, to be the most important direct condition of library development, it accounts for only a little more than half of the variation among the 622 counties in library service. There is need for studies of the influence of other factors, particularly of nonquantitative factors, under specific conditions. Undoubtedly, economic resources have been relatively unimportant in some counties, while historical and personal factors have played a vital part in many. In some communities topography is a primary consideration, in others, local government or politics. Legislation plays an important role, particularly in some states. Units of service are of vital importance in many areas—witness the influence of the town organization in New England and of the adoption of the county unit for library service in California and New Jersey. The availability of reading materials from other sources affects the need for public library service in specific localities. Clubs, churches, traditions, conventions, and leadership—all have been and will continue to be influential in determining the degree of library service maintained in given communities. Careful scrutiny of the action and interaction of these influences could hardly fail to yield much information of practical value to planners of future library development.

PROBLEMS SUGGESTED FOR FURTHER INVESTIGATION

Numerous questions, some of which are amenable to fruitful investigation, have been raised in the course of the study here summarized. Among those most closely related to this study, the following are perhaps worthy of enumeration:

1. The application of techniques of statistical correlation analysis to the local units of other relatively homogeneous regions is suggested. Probably no region is quite as well suited to county analysis as is the Middle West. No other equally homogeneous area combines reasonably complete quantitative records, a sufficient number of counties, and a minimum of counties entirely without public library service. For this reason the use of other units, particularly of library districts and municipalities, offers promise of more fruitful study in other regions. Similar analyses of samples, random and selected, of counties, library districts, and cities, from the country as a whole should yield valuable information. A similar study of counties served by county libraries would be useful in defining the factors associated with varying degrees of county library service and should yield highly important information on minimal population, economic, and other requirements of satisfactory county library service.

2. Careful and detailed historical studies, planned to define and evaluate the historical factors which have significantly influenced the development of library service in the country as a whole and in various states and regions, are needed.

3. Intensive case studies of selected communities, combining the historical approach with statistical and other techniques in an attempt to define factors of causation, are suggested.

4. Fundamental to an ultimate library philosophy which places public library service in its proper social relationships are studies of the status of reading as a social means of transmitting ideas, of providing recreation, and of promoting social stability. In the same category fall studies of the relative cost and effectiveness of supplying society with reading materials from different sources and by means of different agencies. There is definite need of more extensive and intensive study of the accessibility of reading materials in various areas and under different sets of conditions. Such studies may well approach the question from the point of view of the various sources and also from that of the reader. Intensive analyses of relatively limited areas combining the two points of view appear to offer particular promise.

